Секция 5. Методологические основы инновационной педагогики в высшем профессиональном образовании

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METHODOLOGY OF TEACHING AND LEARNING THROUGH DISCUSSIONS OF EDUCATIONAL STANDARDS

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Currently we are exploring a new methodology of teaching and learning. Using web-based technology, both educators and college students are to be offered the opportunities to discuss standards or potential outcomes of the education. Those discussions are to contribute to students' learning on the one hand and instructors' teaching on the other hand.

Particularly, we are dealing with teaching and learning English as a Second Language (ESL). The idea of developing the unique higher education standards captivated Ms Metlitskaya after she learned that the American education system implies standards in higher education curriculum. In Belarus curricula are approved, but they are not necessarily related to the learning outcomes.

When we started the research of the mentioned sphere, it turned out that ESL instructors in Belarus believe in some unique standards' existence and, moreover, that they teach according to these standards. But the curious fact is that every educator seems to understand the accepted levels of English proficiency in his or her own way, not really being aware of the fact. Ms Metlitskaya, an ESL instructor herself, indicates that it was a revelation for her to learn that the unique, clear and detailed standards in the mentioned sphere simply do not exist.

Nevertheless, we strongly believe that the national education standards are essential. First of all, education is not a sphere to be dealt with intuitively. Education is by far the most important social sphere and there is no doubt that it forms the foundation of the society. Secondly, as Ms Metlitskaya points out, the national standards are a necessary condition for providing a basis for mutual recognition of language qualifications in the international community. This is very important for Belarusian specialists wishing their proficiency in English to be acknowledged at the international level.

The offered standards of teaching/learning English as a second language are worked out in accordance with the aspects of teaching/learning a foreign language. They are grammar, speaking, writing, and listening.

A language is a complex many-level phenomenon; therefore, learning of a foreign language presupposes complex synchronous learning of its aspects. Figure 1 demonstrates the set of aspects by content areas considered by Ms Metlitskaya:

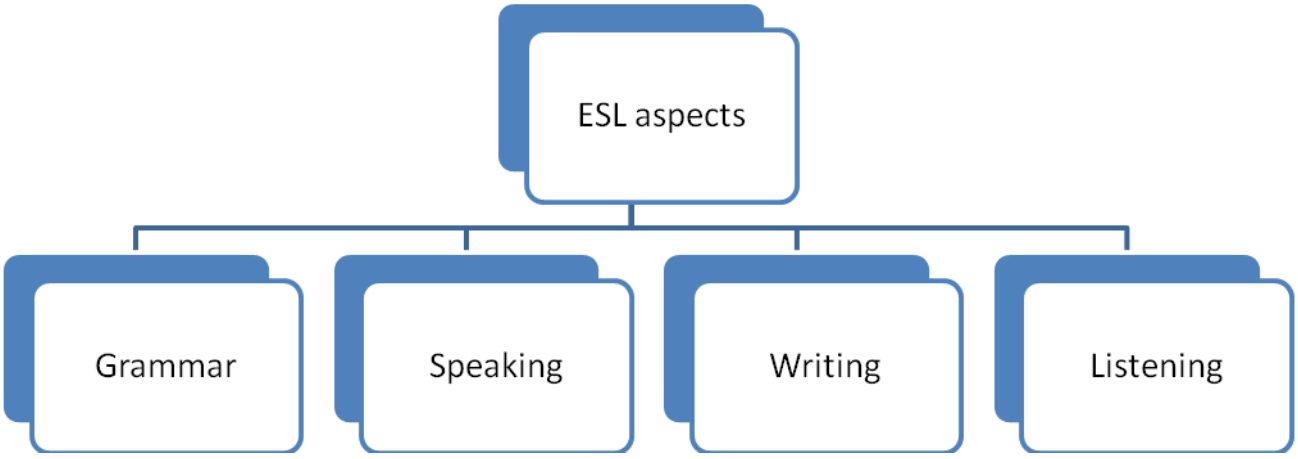

Figure 1. Metlitskaya's structure of ESL aspects by content areas

The standards represent a set of requirements at the following levels of the language proficiency elementary, pre-intermediate, intermediate, upper-intermediate, and advanced.

The requirements are presented according to each ESL aspect, thus showing certain language skills and knowledge that an ESL learner is supposed to have at each level of the language proficiency. The structure of the ESL standards by levels as viewed by Ms Metlitskaya is displayed in Figure 2:

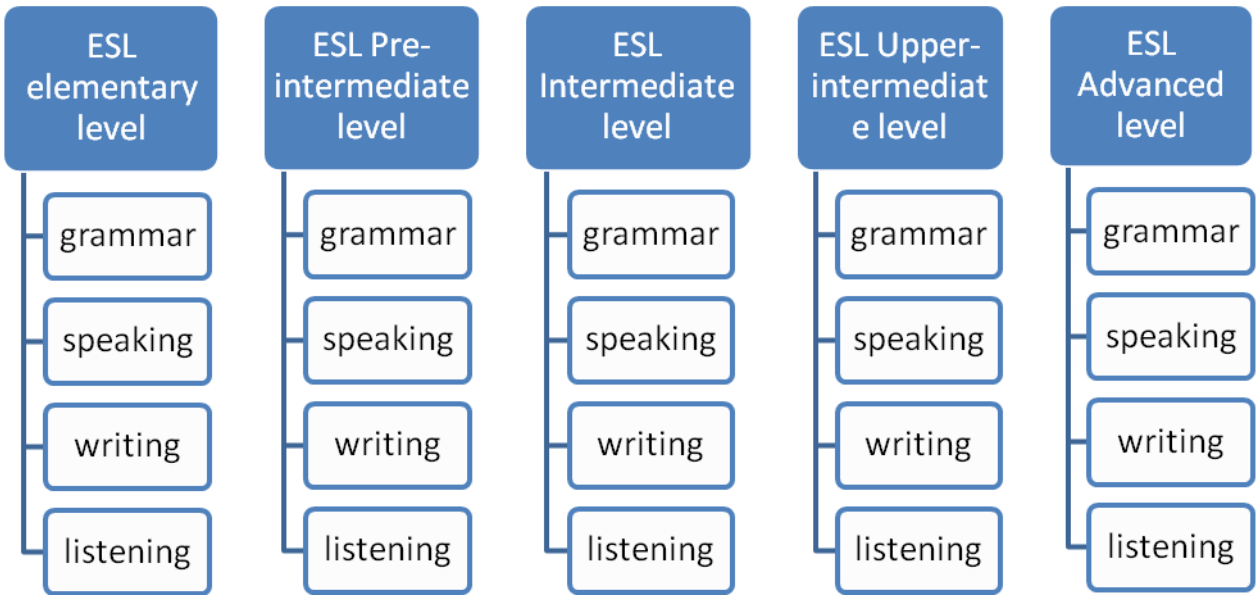

Figure 2. Metlitskaya's classification of ESL standards by levels

In the current year both of us have participated in an international program to advance higher education in Russia and Eastern Europe. One of the outcomes of this program is business communication courses, which have been run in Ural State Technical University - UPI, Russian Federation, and Belarusian State University, Belarus.

Being influenced by this course, Mr Irkho offers the following modifications to Ms Metlitskaya's classification:

To consider educational standards in grammar as a part of those in *writing and reading* or written transmissions;

To consider educational standards in speaking and listening as parts of those in *speaking and listening* or oral transmissions;

To consider educational standards in written and oral transmissions as parts of those in *meaning transmissions*;

To consider and add new aspects of educational standards, such as vocabulary and lingo structures, research and interpretation and reasoning and composition.

Figure 3 represents the structure of ESL standards by content areas offered by Mr Irkho:

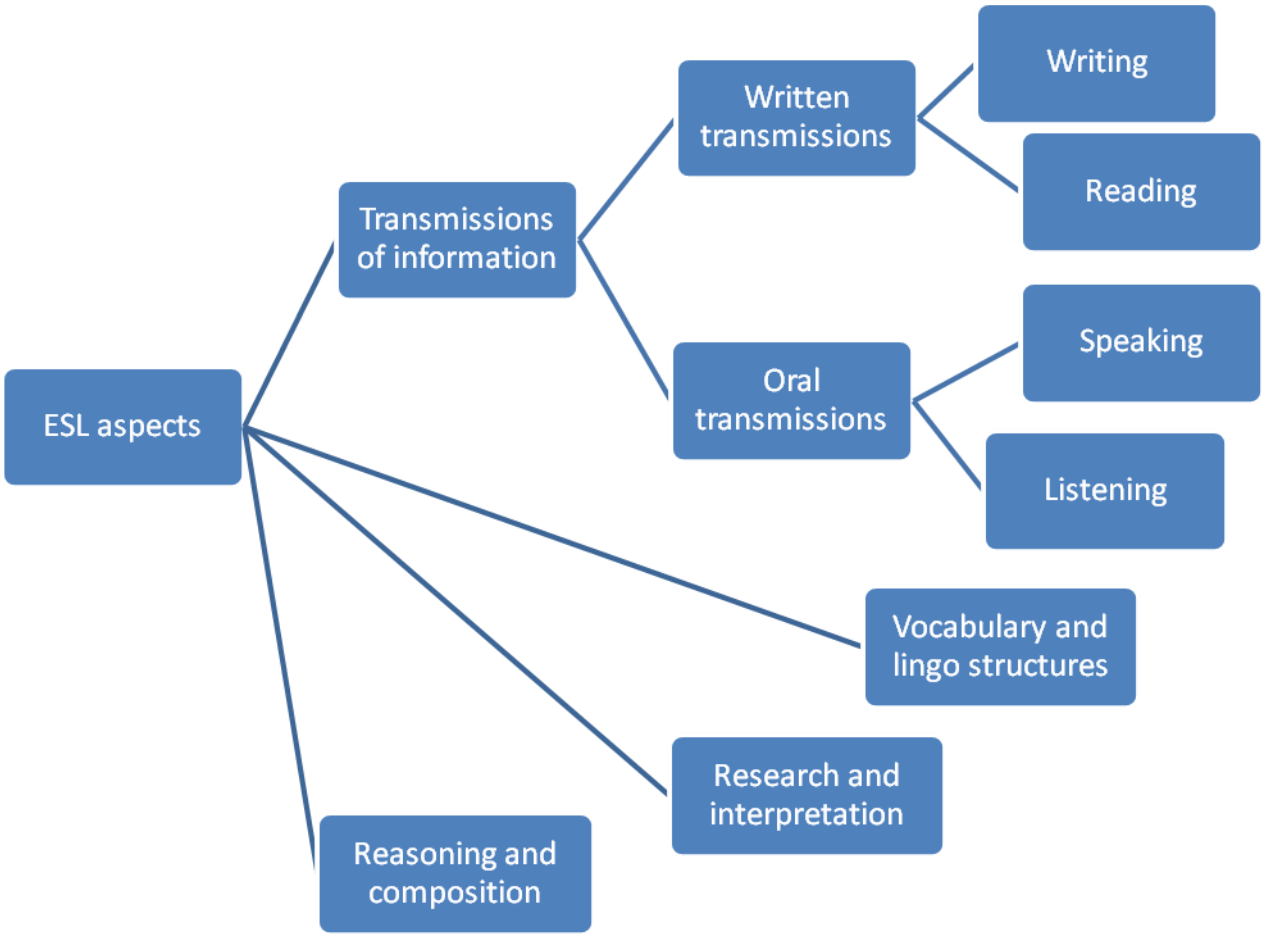

Figure 3. Irkho's structure of ESL aspects by content areas

The classification of the ESL standards by levels as viewed by Mr. Irkho is displayed in Figure 4:

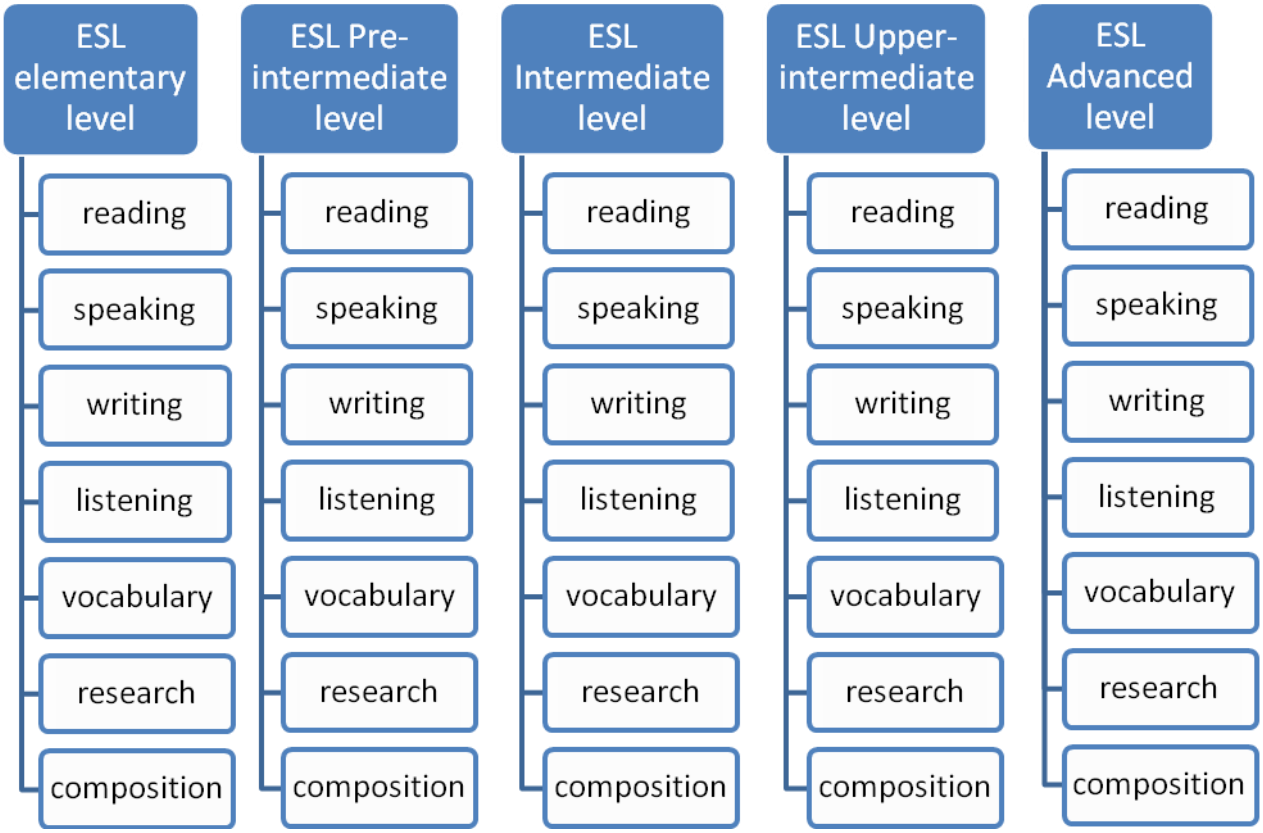

Figure 4. Irkho's classification of ESL standards by levels

The differences between the two presented classifications are obvious. Their reconciliation may be developed in many ways, the major of which seems to be discussions. However, the most intriguing question is what kind of discussions.

Our proposal is to make discussions public and to invite teachers and students to participate in the standards' creation. We believe that a joint decision making process itself could be a new methodology of teaching and learning.

Indeed, we believe that the motivation of both sides of the learning process is higher when students and teachers share an important extent of decision-making authority. Moreover, some special outcomes of the learning activity relevant to particular participants of the learning process may be defined as a result of those discussions.

We do not see those discussions as a sure means for improving teachers and students' performance; however, this methodology is worth trying in the classroom and beyond. The next challenge is how it can be done.

We perceive that those discussions may be effective when:

- the discussion issues are relevant to the interests of the participants;
- the participants have the knowledge to make a functional contribution;
- there is confidence and accountability between all the participants involved.

New information technologies allow us to address all concerned. They make it possible to place discussions outside the classroom, so the choice of participation is optional. The participants may observe previous discussions and have significant knowledge of the discussion topics. Finally, the computer-based software may keep all the participants accountable and this feature may develop mutual confidence.

At the moment we are working on publication of the two presented classifications on the Internet. An important characteristic of this publication should be allocation of links between proposals and web-based discussions. In the nearest future we are also going to test our methodology with our students.

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Ablaev E.V, Mamalyga R.F.

ПРОПЕДЕВТИКА ФРАКТАЛЬНОЙ ГЕОМЕТРИИ В ШКОЛЕ КАК ОПОРА БУДУЩЕГО СОВЕРШЕНСТВОВАНИЯ ПРОФЕССИОНАЛЬНОЙ КОМПЕТЕНТНОСТИ ИНЖЕНЕРНЫХ КАДРОВ

THE FRACTAL GEOMETRY PROPAEDEUTICS IN SCHOOL LIKE A SUPPORT IN FUTURE PROFESSIONAL DEVELOPMENT OF INGINEERINGS PERSONNELS

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Внедрение электронно-вычислительной техники в образовательную среду позволяет внести изменения не только в учебный процесс, но и в значительной мере осовременить содержание учебных программ. В статье приводится обзор результатов работы коллектива студии «геометрия-компьютер-геометрия» по внедрению элементов фрактальной геометрии в школьную программу.

In this article is given the review of work of our studio (named "geometry-computer-geometry") in a direction of introduction of elements fractal geometry in educational school programs.

Уральский регион, как промышленный центр России, нуждается в хорошо подготовленных инженерных кадрах. Высококвалифицированные специалисты в своей профессиональной деятельности довольно часто обращаются к фрактальной теории, так как «многие свойства природных фрактальных структур удобно изучать на модельных фракталах, поскольку применение методов фрактальной геометрии позволяет выявить существенные характеристики как модельных фракталов, так и природных иерархических структур» [5]. Так теория фракталов активно находит свое применение при изучении «хаотического поведения нелинейных динамических и диссипативных систем, турбулентного течения жидкостей, неоднородного распределения материи во Вселенной, при исследовании трещин и дислокационных скоплений в твердых телах и горных породах, при изучении электрического пробоя, диффузии и агрегации частиц, роста кристаллов и т.д.» [2]. Также при изучении объектов, имеющих сложную геометрическую структуру, таких как пористые материалы, природные объекты - рифы, облака и пр. в современных исследованиях не обходится без фрактального моделирования [3].

Фрактальная компьютерная графика, фрактальная радиофизика, фрактальный конденсатор – становятся обыденными понятиями и терминами.

Кроме того, широкое распространение получили фрактальные методы сжатия информации и фрактальные формы антенн при передаче информации [6].